REMARKS

This is in response to the Office Action dated July 7, 2005. Claims 1-28, 30-31, 34-37 and 63-144 have been canceled. Thus, claims 29, 32, 33 and 38-62 are now pending.

Claim 29 stands rejected under 35 U.S.C. Section 103(a) as being allegedly unpatentable over Adomi (US 5,442,201) in view of Tomomura (WO 98/44539; US 6,358,822). This Section 103(a) rejection is respectfully traversed for at least the following reasons.

Claim 29 requires that "a technique selected from among a molecular beam epitaxial (MBE) growth method, and a gas source molecular beam epitaxial (GS-MBE) growth method is used, supplying aluminum and ammonium (NH_3) to a surface of the crystal so as to obtain a mixed crystal with a composition comprising nitrogen, wherein crystallization of the nitrogen from the ammonium which is supplied to the surface of the crystal into the surface of the crystal is accelerated by the aluminum supplied to the surface of the crystal, and the substrate is at a temperature of 450 degrees C or more and less than 640 degrees C when the aluminum and ammonium are supplied in growing the III-V compound semiconductor that includes, as V group components, nitrogen and at least one of arsenic (As), phosphorous (P), and antimony (Sb)." Certain example embodiments of the instant invention relate to making a mixed crystal with a composition comprising nitrogen by *crystallizing nitrogen into a mixed crystal*, and not simply by adding nitrogen. Also, the limitation on the substrate temperature is a constituent feature in the manufacturing method since the limitation on the substrate temperature has been shown to be effective and provide unexpected results in the MBE and/or MO-MBE method(s).

Adomi relates to a method which adds nitrogen to function as isoelectronic traps in AlGaP. This is clear in that the concentration of nitrogen that appears in a crystal that has been produced by Adomi is about 2.2×10^{20} [atoms/cm^3] at a maximum (see Figure 4).

In contrast, certain example embodiments of the instant invention have a purpose of *crystallizing nitrogen into a mixed crystal* as a composition order. Certain example embodiments of this invention further disclose that the substrate temperature of 450°C or more and less than 640°C using the MBE method and/or the MO-MBE method is an important constituent to crystallize nitrogen into a mixed crystal. The cited art fails to disclose or suggest these features.

The Office Action alleges that the range of the substrate temperature as disclosed in claim 29 overlaps the temperature range of Tomomura. However, the substrate temperature of 450°C or more and less than 640°C of claim 29 is a temperature range which was discovered under a situation particular to wherein *nitrogen is crystallized into a mixed crystal* utilizing the cracking catalytic effect of aluminum by using the MBE and/or MO-MBE method.

Regarding the lower limit of the substrate temperature, as disclosed in the specification of the instant application, the temperature range of equal to or greater than 450°C is set based on the experimental fact that it is possible to crystallize nitrogen into a mixed crystal as a composition order in a temperature substrate range of 450°C or more. This reflects the temperature dependency of the catalytic characteristic of aluminum which functions as a cracking catalyst for NH_3. Both cited references Tomomura and/or Adomi fail to disclose or suggest this feature. Specifically, Tomomura does not even supply A1 and NH_3 simultaneously, and Adomi does not have an intention of crystallizing nitrogen into a mixed crystal on the composition order.

Regarding the upper limit of the substrate temperature, as also described in the specification of the instant application, the upper limit set to equal to or less than 640°C is based on the experimental fact that substrate temperature of higher than 640°C is undesirable because a nitride phase of AlGaN or the like, which is readily generated at a high temperature, is mixed

and causes phase specification. Similarly, both cited references Tomomura and/or Adomi do not teach or suggest this feature. Specifically, Tomomura does not even supply Al and NH_3 simultaneously and Adomi does not have an intention of crystallizing nitrogen into a mixed crystal on the composition order. Accordingly, it is respectfully submitted that the aforesaid quoted features of claim 29 are not disclosed or suggested by the art of record.

In view of the above, it will be appreciated that neither Adomi nor Tomomura disclose using ammonium and aluminum together as a method of crystal growth at the temperature required by claim 29. Moreover, there is no motivation to combine the two references. For example, Tomomura teaches using molecular beam epitaxy techniques to form layers, whereas Adomi is entirely different and uses metal organic vapor phase epitaxy techniques. The two techniques are much different from one another and involve different temperatures. The alleged combination would never have been made.

For at least the foregoing reasons, it is respectfully requested that all rejections be withdrawn. All claims are in condition for allowance. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

Respectfully submitted,

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